

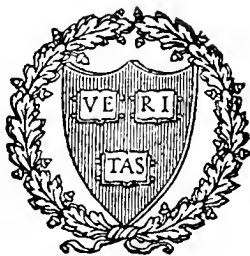
Analytical table of Lindley's
natural orders of the vegetable
kingdom.

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From Prof. John D. Sargent

ANALYTICAL TABLE
OF
LINDLEY'S NATURAL ORDERS
OF THE
VEGETABLE KINGDOM.

BOSTON.
1874.



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1874a

ANALYTICAL TABLE
OF
LINDLEY'S NATURAL ORDERS OF PLANTS.

MODIFIED FROM
BALFOUR'S CLASS BOOK OF BOTANY.

MASSACHUSETTS INSTITUTE OF TECHNOLOGY, 1874.

Flowerless plants, reproducing by spores. **CRYPTOGAMIA. D.**
Flowering plants, reproducing by seeds.

Embryo with a single cotyledon. Parts of the flower in 3's.
Leaves mostly parallel veined. Woody bundles of the stem
scattered among the cellular tissue. Endogenous. **C.**

Embryo with two or more cotyledons, — or none. Parts of
the flower in 5's or 4's, or indefinite. Leaves net veined.
Woody bundles of the stem symmetrically arranged around
a central pith. Exogenous.

Flowers having a calyx only, which is sometimes corolla like.
Apetalous. **B.**

Flowers having neither calyx nor corolla. Asepalous. **B.**

Flowers having both calyx and corolla.

Petals partly or wholly united — or monopetalous. **A.**

Petals distinct, or polypetalous.

Stamens and corolla inserted on the receptacle. **I, a. p. 3.**

Stamens and petals inserted on the calyx. **I, b. p. 8.**

- A.** — Corolla and stamens inserted on the calyx. **I, c. p. 12.**
 Corolla inserted on the receptacle.
 Stamens inserted on the receptacle and distinct from the corolla. **I, d. p. 14.**
 Stamens adherent to the corolla. **I, e. p. 14.**
- B.** — Stigma none. Seeds not enclosed in a pericarp. Embryo with more than two cotyledons, — rarely two.
 GYMNOSPERMS. **II, b. p. 20.**
 Stigma present. Ovules in a pericarp.
 Embryo with two cotyledons. ANGIOSPERMS. **II, a. p. 17.**
 Embryo acotyledonous. SPOROGENS. **II, c. p. 21.**
- C.** — Leaves net veined. **III, a. p. 21.**
 Leaves parallel veined.
 Perianth glumaceous, or consisting of imbricated bracts, mostly in pairs. **III, e. p. 25.**
 Perianth not glumaceous.
 Perianth adherent to the ovary, flowers complete.
III, b. p. 22.
 Perianth free from the ovary, flowers complete.
III, c. p. 23.
 Perianth none, flowers incomplete. **III, d. p. 24.**
- D.** — With a distinct stem bearing leaves or branches, and having woody tissue and vessels. ACROGENS. **IV, a. p. 25.**
 With no distinction of stem and leaves, but consisting of variously formed expansions of cellular tissue.
 THALLOGENS. **IV, b. p. 26.**

In the following pages p. refers to the page of Gray's "Field, Forest and Garden Botany" on which the order is described.

The mark † indicates that Gray refers the plants to a different natural order.

When a natural order is given without reference to Gray, the plants included in the order are not found in the United States.

I, a. — THALAMIFLORAL EXOGENS.

Stamens fewer than 20. **6**

Stamens more than 20.

Leaves with stipules. **4**

Leaves without stipules.

Carpels combined into a single ovary. Placentas more than one. **1**

Carpels distinct, — or solitary.

Stamens united into one set or more. **HYPERICACEÆ.** p. 61

Stamens distinct.

Carpels immersed in a flat-topped, fleshy disc.

NELUMBIACEÆ. p. 46.

Carpels not immersed in the disc.

Embryo enclosed in a vitellus or sac. Aquatic.

CABOMBACEÆ.

Embryo not enclosed in a vitellus, — minute.

Seeds with an aril. Trees or shrubs. **DILLENACEÆ.**

Seeds without an aril.

Albumen of the seeds mottled. **ANONACEÆ.** p. 43.

Albumen of the seeds homogeneous.

Flowers perfect, having both stamens and pistils.

RANUNCULACEÆ. p. 33.

Flowers imperfect, — some staminate, some pistillate. Trail-
ing shrubs. **SCHIZANDRACEÆ.**

1. — Placentas in the axis. **2**

Placentas parietal.

Seeds without albumen. **CAPPARIDACEÆ.** p. 56

Seeds albuminous.

Embryo in a vitellus, or sac. Aquatic. **NYMPHEACEÆ.** p. 46.

Embryo not in a vitellus.

Seeds contained in a pulp. Juice watery. **FLACOURTIACEÆ.**

Seeds not contained in a pulp. Juice milky.

PAPAVRACEÆ. p. 48.

2. — Stigma petaloid, umbrella like. SARRACENIACEÆ. p. 47.
Stigma simple, not peculiar.

Leaves compound. RHIZOBOLACEÆ.

Leaves simple.

Petals not as many as the sepals. TERNSTROMIACEÆ.

Petals as many as the sepals.

Seeds numerous. 3

Seeds few.

Stigma nearly sessile, radiating or peltate. GUTTIFERÆ.

Stigma on a distinct style, — five lobed. HUMIRIACEÆ.

3. — Petals flat. MARCGRAVIACEÆ.

Petals crumpled. CISTACEÆ. p. 60.

4. — Carpels distinct, numerous. MAGNOLIACEÆ. p. 42.

Carpels combined into a solid pistil. More than one placenta.

Calyx valvate in the bud. 5

Calyx imbricated or twisted in the bud.

Flowers in heads, having an involucre. CHLÆNACEÆ.

Flowers separate, having no involucre. CISTACEÆ. p. 60.

5. — Calyx irregular, — enlarged in fruit. DIPTEROCARPACEÆ.

Calyx regular, — not enlarged in fruit.

Stamens distinct. TILIACEÆ. p. 75.

Stamens united wholly or partially.

Anthers one celled. MALVACEÆ. p. 70.

Anthers two celled.

Stamens columnar, all perfect. STERCULIACEÆ. p. 75.

Stamens not columnar, — some without anthers.

BYTTNERIACEÆ.

6. — Leaves with stipules. 16

Leaves without stipules.

Carpels combined into a solid pistil or ovary. 7

Carpels distinct, or solitary.

Anthers with recurved valves. BERBERIDACEÆ. p. 44.

Anthers with longitudinal valves.

Albumen of seeds scanty, — or none.

MENISPERMACEÆ. p. 44.

Albumen of seeds abundant. Embryo minute.

Flowers all imperfect, some staminate, some pistillate. Seeds numerous. LARDIZABALACEÆ.

Flowers partly imperfect, some staminate, some pistillate, some perfect. Seeds one or two. XANTHOXYLACEÆ. p. 82.†

Flowers all perfect.

Embryo in a vitellus, or sac. Aquatic. CABOMBACEÆ.

Embryo not in a vitellus.

Seeds with a mottled albumen. Shrubs. ANONACEÆ. p. 42.

Seeds with a homogeneous albumen. Herbs.

Sepals two. FUMARIACEÆ. p. 49.

Sepals more than two. RANUNCULACEÆ. p. 33.

7.—Placentas covering the dissepiments. Aquatic.

NYPHÆACEÆ. p. 46.

Placentas in the axis. **9**

Placentas parietal.

Stamens tetradynamous, four long and two short.

CRUCIFERÆ, p. 51.

Stamens not tetradynamous.

Disc small, or none. **8**

Disc large.

Parts of flower in 4's. Fruit closed at apex.

CAPPARIDACEÆ. p. 56.

Parts of flower not in 4's. Fruit open at apex.

RESEDACEÆ. p. 57.

8.—Albumen of seeds scanty or none. FRANKENIACEÆ.

Albumen of seeds abundant.

Fruit fleshy with a central pulp. FLACOURTIACEÆ.

Fruit without pulp. Juice milky. PAPAVERACEÆ. p. 48.

9.—Styles more or less united. **10**

Styles separate to the base.

Calyx valvate in the bud. VIVIANACEÆ.

Calyx imbricate in the bud.

Petals twisted in the bud. Embryo straight. LINACEÆ. p. 77

Petals not twisted. Embryo curved.

CARYOPHYLLACEÆ. p. 63.

10. — Fruit gynobasic, having the apices of the carpels united to the summit of the axis. **14**

Fruit not gynobasic.

Calyx valvate in the bud. **12**

Calyx imbricate in the bud.

Calyx irregular. **13**

Calyx regular.

Carpels less than four. **11**

Carpels four or more.

Seeds winged. CEDRELACEÆ.

Seeds wingless.

Stamens united into a long tube. MELIACEÆ. p. 84.

Stamens separate or nearly so.

Leaves dotted. AURANTIACEÆ. p. 83.†

Leaves without dots. BREXIACEÆ.

11. — Seeds hairy or downy. TAMARICACEÆ. p. 63.

Seeds not hairy.

Ovules ascending or horizontal. PITTOSPORACEÆ. p. 57.

Ovules suspended. CYRILLACEÆ.

12. — Anthers opening by pores. TREMANDRACEÆ.

Anthers opening by slits.

Calyx enlarging in fruit. OL^{AC}EACEÆ. p. 279.

Calyx continuing small. ICACINACEÆ.

13. — Flowers symmetrical. GUTTIFERÆ.

Flowers unsymmetrical.

Petals with appendages at base. SAPINDACEÆ. p. 88.

Petals without appendages at base.

Fruit a samara, with a membranaceous wing.

ACERACEÆ. p. 91.

Fruit not a samara. Flowers having a papilionaceous aspect.

Ovary two celled. POLYGALACEÆ. p. 92.

Ovary one celled. KRAMERIACEÆ.

14. — Stamens arising from scales. SIMARUBACEÆ. p. 83.

Stamens not arising from scales.

Styles separate at the apex. **15**

Styles wholly united into one.

Flowers all perfect. *RUTACEÆ*. p. 81.

Flowers partly imperfect, some staminate, some pistillate,
some perfect. *XANTHOXYLACEÆ*. p. 82.†

15. — Flowers regular. *LIMNANTHACEÆ*. p. 77.†

Flowers irregular.

Fruit with elastic, recurved valves. *BALSAMINACEÆ*. p. 81.†

Fruit without elastic valves. *TROPÆOLACEÆ*. p. 81.†

16. — Carpels distinct or solitary. Anthers with recurved valves.

BERBERIDACEÆ. p. 44.

Carpels united. More than one placenta.

Placentas in the axis. **17**

Placentas parietal.

Leaves rolled up in the bud, with glandular hairs.

DROSERACEÆ. p. 59.

Leaves straight in the bud, without glandular hairs.

VIOLACEÆ. p. 58.

17. — Styles more or less united. **18**

Styles distinct to the base.

Calyx valvate in the bud. *TILIACEÆ*. p. 75.‡

Calyx imbricate in the bud.

Marsh plants. Petals small, sessile. *ELATINACEÆ*. p. 63.

Trees or shrubs. Petals conspicuous, stalked.

MALPIGHIACEÆ.

18. — Fruit gynobasic, with the carpels attached to the apex. **20**

Fruit not gynobasic.

Calyx valvate in the bud. **19**

Calyx imbricate in the bud.

Flowers in heads, with an involucre. *CULENACEÆ*.

Flowers without an involucre.

Stamens three, united. *HIPPOCRAT^æACEÆ*.

Stamens more than three.

Calyx glandular. *MALPIGHIACEÆ*.

Calyx not glandular.

Embryo curved. *SAPINDACEÆ*. p. 88.

Embryo straight. *ERYTHROXYLACEÆ*.

19.—Stamens arranged in a column. STERCULIACEÆ. p. 75.

Stamens not columnar.

Stamens opposite the petals. VITACEÆ. p. 85.

Stamens alternate with the petals, or numerous.

TILIACEÆ. p. 75.

20.—Gynobase fleshy. OCHNACEÆ.

Gynobase dry.

Leaves regularly opposite. ZYGOPHYLLACEÆ.

Leaves mostly alternate.

Fruit beakéd. GERANIACEÆ. p. 77.

Fruit not beaked. OXALIDACEÆ. p. 77.†

I, b. CALYCIFLORAL EXOGENS. *Polypetalous.*

Stamens less than twenty. **7**

Stamens more than twenty.

Ovary inferior or partially so. **3**

Ovary wholly superior.

Leaves with stipules. **2**

Leaves without stipules.

Carpels combined into a solid pistil, with more than one placenta. **1**

Carpels more or less distinct, or solitary.

Ovules suspended or ascending. ROSACEÆ. p. 115.

Ovules attached by a cord to the base of the cell.

ANACARDIACEÆ. p. 84.

1.—Calyx of two sepals cohering at base.

PORTULACACEÆ. p. 69.

Calyx of more than two sepals, tubular, permanent.

LYTHRACEÆ. p. 149.

2.—Carpels combined into a solid pistil, with more than one placenta. Placentas in the axis. PORTULACACEÆ. p. 59.

Carpels more or less distinct or solitary.

Calyx with the odd lobe inferior or anterior.

LEGUMINOSÆ. p. 94.

Calyx with the odd lobe superior or posterior.

ROSACEÆ. p. 115.

3. — Leaves with stipules. 6

Leaves without stipules.

Placentas in the axis. **4**

Placentas parietal.

Petals definite, distinct from calyx, hooded.

LOASACEÆ. p. 151.

Petals indefinite, passing into sepals. CACTACEÆ. p. 152.

4. — Leaves without dots. 5

Leaves with transparent dots.

Ovary one celled. Cotyledons not distinct.

CHAMELAXACEÆ.

Ovary more than one celled. Cotyledons distinct.

MYRTACEÆ. p. 149.

5. — Petals indefinite, numerous. MESEMBRYANTHEMACEÆ. p. 156.

Petals definite, few.

Petals linear, reflexed. ALANGIACEÆ.

Petals round, concave.

Style one, stigma having a round head. BARRINGTONIACEÆ.

Styles and stigmas more than one. PHILADELPHACEÆ. p. 134.

6. — Carpels more or less distinct, or solitary, covered by the calyx. ROSACEÆ. p. 151.

Carpels united into a solid pistil.

Leaves opposite. RHIZOPHORACEÆ.

Leaves alternate. Fruit a covered cup. LECYTHIDACEÆ.

7. Ovary inferior, or partly so. 17

Ovary wholly superior.

Leaves with stipules. **12**

Leaves without stipules.

Carpels combined into a solid pistil. **8**

Carpels more or less distinct or solitary.

Carpels, each with a hypogynous scale.

CRASSULACEÆ. p. 137.

Carpels without hypogynous scales.

Carpels several, all perfect. CALYCANTHACEÆ. p. 130.

Carpels solitary, or all but one imperfect.

Leaves dotted. AMYRIDACEÆ.

Leaves not dotted.

Plants with resinous juice. ANACARDIACEÆ. p. 84.

Plants with watery juice. CONNARACEÆ.

8. Placentas in the axis. 9

Placentas parietal.

Flowers imperfect, some staminate, some pistillate.

PAPAYACEÆ.

Flowers perfect, having both stamens and pistils.

TURNERACEÆ.

9. Styles more or less combined. 10

Styles distinct to the base.

Carpels, each with a hypogynous scale. CRASSULACEÆ.

Carpels two, without scales. SAXIFRAGACEÆ. p. 131.

10. Calyx valvate in the bud. 11

Calyx imbricate in the bud.

Sepals two. PORTULACACEÆ. p. 69.

Sepals more than two.

Ovules ascending. CELASTRACEÆ. p. 87.

Ovules suspended. BRUNIACEÆ.

11. — Stamens as many as the petals, and opposite to them.

RHAMNACEÆ. p. 86.

Stamens alternate with the petals. LYTHRACEÆ. p. 149.

12. — Carpels combined into a solid pistil. 13

Carpels distinct, or solitary.

Fruit a pod. Odd sepal inferior. LEGUMINOSÆ. p. 94.

Fruit not a pod. Odd sepal superior. ROSACEÆ. p. 115.

13. — Placentas in the axis. 14

Placentas parietal.

Flower with a ring of abortive petals.

PASSIFLORACEÆ. p. 157.

Flower without abortive petals. MORINGACEÆ.

14. — Styles more or less combined. 15

Styles distinct to the base.

Petals minute. ILLECEBRACEÆ.

Petals conspicuous.

Leaves opposite. CUNONIACEÆ. p. 131.†

Leaves alternate. SAXIFRAGACEÆ. p. 131.

15. — Calyx valvate in the bud. **16**

Calyx imbricate in the bud.

Flowers spurred. VOCHYSIACEÆ.

Flowers spurless.

Leaves simple. STACKHOUSIACEÆ.

Leaves compound. STAPHYLÆACEÆ. p. 89.†

16. — Stamens opposite the petals, of the same number.

RHAMNACEÆ. p. 86.

Stamens alternate with the petals. AMYRIDACEÆ.

17. — Leaves with stipules. **22**

Leaves without stipules.

Placentas parietal. Fruit a berry.

GROSSULARIACEÆ. p. 133.†

Placentas in the axis.

Flowers not in umbels. **18**

Flowers in umbels.

Styles two. UMBELLIFERÆ. p. 162.

Styles more than two. ARALIACEÆ. p. 166.

18. — Carpels more than one to each flower. **19**

Carpels one to each flower.

Plants parasitic. LORANTHIACEÆ. p. 292.

Plants not parasitic.

Petals linear, reflexed. ALANGIACEÆ.

Petals oblong.

Plants with a resinous juice. ANACARDIACEÆ. p. 84.

Plants without a resinous juice.

Cotyledons rolled up. COMBRETACEÆ.

Cotyledons flat. HALORAGACEÆ. p. 140.

19. — Calyx limb minute. HALORAGACEÆ. p. 140.

Calyx limb conspicuous.

Carpels not separating at the apex. **20**

Carpels separating widely at the apex.

Leaves alternate. Herbs. SAXIFRAGACEÆ. p. 131.

Leaves opposite. Shrubs. HYDRANGEACEÆ. p. 132.†

20.— Calyx not valvate in the bud. **21**

Calyx valvate in the bud.

Embryo curved. TETRAGONIACEÆ. p. 156.†

Embryo straight.

Stamens opposite the petals, and of the same number.

RHAMNACEÆ. p. 86.

Stamens alternate with the petals, or not of the same number.

Albumen none. ONAGRACEÆ. p. 141.

Albumen copious. CORNACEÆ. p. 167.

21.— Stamens doubled downwards. Anthers elongated. Leaves ribbed. MELASTOMACEÆ. p. 148.

Stamens not doubled down. Anthers short.

Seeds very numerous, minute. ESCALLIONACEÆ.

Seeds few, one to four. BRUNIACEÆ.

22.— Placentas parietal. Stipules becoming tendrils.

CUCURBITACEÆ. p. 158.

Placentas in the axis.

Stamens opposite the petals, and of the same number.

RHAMNACEÆ. p. 86.

Stamens alternate with the petals, or not of the same number.

Leaves opposite. RHIZOPHORACEÆ.

Leaves alternate. HAMAMELIDACEÆ. p. 140.

I, c.— CALYCIFLORAL EXOGENS. *Monopetalous.*

23.— Ovary inferior. **24**

Ovary superior.

Leaves with minute stipules. STACKHOUSIACEÆ.

Leaves without stipules.

Carpels one to each flower. Stigma with a cup-like covering.

BRUNONIACEÆ.

Carpels more than one to each flower.

Carpels separate. CRASSULACEÆ. p. 137.

Carpels combined into one fruit.

Flowers perfect, having both stamens and pistils.

STYRACACEÆ. p. 220.

Flowers imperfect, some staminate, some pistillate.

PAPAYACEÆ.

24.— Carpels more than one in each flower. **26**

Carpel one in each flower.

Anthers separate. **25**

Anthers united.

Ovule erect. COMPOSITÆ. p. 179.

Ovule suspended. CALYCERACEÆ.

25.— Fruit an achene, with the rudiments of two others.

VALERIANACEÆ. p. 177.

Fruit a single achene, without rudimentary ones.

Fruit crowned with the calyx, and covered with an involucl.

DIPSACEÆ. p. 178.

Fruit not crowned. No involucl. LORANTHACEÆ. p. 292.

26.— Leaves without stipules. **27**

Leaves with stipules.

Stipules between opposite petioles. CINCHONACEÆ. p. 173.

Stipules forming tendrils. CUCURBITACEÆ. p. 158.

27.— Anthers united. LOBELIACEÆ. p. 208.

Anthers separate.

Stamens two. COLUMELLIACEÆ.

Stamens more than two.

Anthers opening by pores. VACCINIACEÆ. p. 211.†

Anthers opening by slits.

Stigma with a covering. GOODENIACEÆ.

Stigma without a covering.

Stamens numerous. BELVISIACEÆ.

Stamens two, attached to the pistil. STYLIDIACEÆ.

Stamens four or five.

Leaves alternate. CAMPANULACEÆ. p. 209.

Leaves opposite, in pairs. CAPRIFOLIACEÆ. p. 169.

Leaves in whorls. GALIACEÆ. p. 173.†

I, d.—COROLLIFLORAL EXOGENS. *Stamens Hypogynous.*

Ovary a single carpel. Stigma with a covering.

BRUNONIACEÆ.

Ovary composed of two or more carpels.

Anthers opening by pores. **1**

Anthers opening by slits.

Leafy resinous plants. RUTACEÆ. p. 81.

Scaly parasitic plants. MONOTROPACEÆ. p. 212.†

1. — Herbs. Seeds with a loose covering. PYROLACEÆ. p. 212.

Shrubs. Seeds with an adherent covering.

Anthers two celled, with appendages. ERICACEÆ. p. 210.

Anthers one celled, without appendages. EPACRIDACEÆ.

I, e.—COROLLIFLORAL EXOGENS. *Stamens Perigynous.*

Flowers irregular. **10**

Flowers regular.

Ovary not divided into lobes. **1**

Ovary having three lobes or more.

Flowers arranged in twisted cymes. BORAGINACEÆ. p. 254.

Arrangement of flowers straight. NOLANACEÆ. p. 266.

1. — Ovary formed by one carpel. **9**

Ovary formed by two carpels. **5**

Ovary formed by three carpels. **4**

Ovary formed by more than three carpels.

Stamens alternate with the divisions of the corolla. **2**

Stamens opposite the divisions of the corolla.

Styles five, rarely three or four. PLUMBAGINACEÆ. p. 222.

Style one.

Trees or shrubs. Fruit fleshy. MYRSINACEÆ.

Herbs. Fruit a capsule. PRIMULACEÆ. p. 222.

2. — Carpels separate. ANONACEÆ. p. 43.

Carpels united.

Ovules pendulous. **3**

Ovules erect or ascending.

Corolla imbricate in the bud. SAPOTACEÆ. p. 220.

Corolla plaited in the bud. CONVULVULACEÆ. p. 262.

3. — Embryo large. SAPOTACEÆ. p. 220.

Embryo small.

Stamens as many as the divisions of the corolla.

AQUIFOLIACEÆ. p. 218.

Stamens twice as many as the divisions of the corolla.

EBENACEÆ. p. 219.

4. — Herbs. Seeds angular, oval, or winged.

POLEMONIACEÆ. p. 260.

Undershrubs. Seeds peltate. DIAPENSIACEÆ.

5. — Stamens four or more. **6**

Stamens two.

Corolla four cleft. OLEACEÆ. p. 279.

Corolla five to eight cleft, salver form.

JASMINACEÆ. p. 279. †

6. — Flowers not arranged in twisted cymes. **7**

Flowers arranged in coiled cymes (scorpioidal).

Fruit a capsule. HYDROPHYLLACEÆ. p. 258. †

Fruit a drupe. EHRETIACEÆ.

7. — Leaves opposite, whorled, or clustered. **8**

Leaves none. Scaly parasites. CUSCUTACEÆ. p. 263. †

Leaves alternate.

Style two cleft. Fruit a drupe. CORDIACEÆ.

Style not two cleft. Fruit a capsule, follicle, or berry.

Leaves with hair like stipules between the petioles.

ASCLEPIADACEÆ. p. 276.

Leaves without stipules.

Ovules few. Flowers plaited in the bud.

CONVOLVULACEÆ. p. 262.

Ovules numerous.

Corolla valvate in the bud. SOLANACEÆ. p. 265.

Corolla imbricate in the bud. ATROPACEÆ. p. 266. †

8. — Anthers united to the stigma. ASCLEPIADACEÆ. p. 276.

Anthers free from the stigma.

Leaves with stipules, often 3–5 ribbed. GENTIANACEÆ. p. 270.

Leaves without stipules.

Stigma with an hour-glass contraction. Corolla twisted in the bud. APOCYNACEÆ. p. 274.

Stigma without a contraction. Corolla valvate in the bud.

LOGANIACEÆ. p. 273.

9. — Fruit one celled, one seeded. SALVADORACEÆ.

Fruit spuriously two celled. PLANTAGINACEÆ. p. 221.

10. — Ovary four lobed. Flowers in nearly sessile cymes placed in the axils of opposite leaves. LABIATÆ. p. 243.

Ovary not lobed.

Ovary formed by one carpel. SELAGINACEÆ.

Ovary formed by two carpels.

Fruit of four adherent achenes. VERBENACEÆ. p. 241.

Fruit of two coherent achenes. SELAGINACEÆ.

Fruit capsular or succulent.

Placentas free, central. LENTIBULARIACEÆ. p. 225.

Placentas in the axis. 11

Placentas parietal.

Seeds winged. BIGNONIACEÆ. p. 226.

Seeds not winged.

Leafless plants. Scaly parasites. OROBANCHACEÆ. p. 228.

Leafy plants.

Cotyledons minute. Radicle long. GESNERACEÆ. p. 228.

Cotyledons large and fleshy. Radicle short.

Fruit a drupe or capsule. PEDALIACEÆ.

Fruit woody with a pulpy interior. CRESCENTIACEÆ.

11. — Seeds with albumen. SCROPHULARIACEÆ. p. 229.

Seeds without albumen.

Seeds winged. BIGNONIACEÆ. p. 226.

Seeds without wings, attached to hard placental processes.

ACANTHACEÆ. p. 239.

II, a. — APETALOUS ANGIOSPERMS.

Having a single perianth or calyx. **5**

Without a perianth, having neither calyx nor corolla.

Leaves with stipules. **2**

Leaves without stipules.

Flowers imperfect, some staminate, some pistillate. **1**

Flowers perfect, having both stamens and pistils.

Embryo in a vitellus, or sac. PIPERACEÆ.

Embryo not in a vitellus. PODOSTEMONACEÆ.

1. — Flowers in aments. Carpels single. MYRICACEÆ. p. 395.

Flowers not in aments. Carpels two or more.

Fruit four seeded. Seeds peltate. Aquatic.

CALLITRICHACEÆ.

Fruit usually three seeded. Seeds not peltate.

EUPHORBIACEÆ. p. 293.

2. — Flowers imperfect, some staminate, some pistillate. **3.**

Flowers perfect, having both stamens and pistils.

Carpels three or four. Ovule erect. Embryo in a vitellus,
or sac. Marsh herbs. SAURURACEÆ. p. 293.

Carpel single.

Ovule erect. Embryo in a vitellus, or sac. PIPERACEÆ.

Ovule suspended. Embryo not in a vitellus.

CHLORANTHACEÆ.

3. — Ovary with two cells or more. **4**

Ovary one celled.

Ovules many, hairy or downy. SALICACEÆ. p. 307.

Ovules not more than two.

Ovule erect. MYRICACEÆ. p. 305.

Ovule pendulous. PLATANACEÆ. p. 300.

4. — Seeds winged. ALTINGIACEÆ.

Seeds wingless. EUPHORBIACEÆ. p. 293.

5. — Ovary inferior, or partly so. **17**

Ovary superior.

Leaves with stipules. **13**

Leaves without stipules.

Flowers imperfect, some staminate, some pistillate. **9**

Flowers perfect, having both stamens and pistils.

Carpels more than one. **8**

Carpel single.

Anther valves recurved. LAURACEÆ. p. 290.

Anthers slit lengthwise.

Leaves covered with scales. ELÆAGNACEÆ. p. 292.

Leaves not covered with scales.

Perianth short, segments separate nearly to the base. **7**

Perianth long or tubular.

Perianth not at all hardened. **6**

Perianth partially hardened.

Perianth hardened at base. NYCTAGINACEÆ. p. 283.

Perianth tube hardened. SCLERANTHACEÆ. p. 64.†

6. — Stamens in the points of the perianth. PROTEACEÆ.

Stamens not in the points of the perianth.

Ovule erect, orthotopal. POLYGONACEÆ. p. 287.

Ovule suspended, anatropal. THYMELÆACEÆ. p. 291.

7. — Stamens attached to the perianth. BASELLACEÆ.

Stamens inserted on the receptacle.

Stamens alternate with the segments of the perianth, or numerous. PHYTOLACCACEÆ. p. 284.

Stamens opposite the segments of the perianth.

Flowers with bracts. AMARANTHACEÆ. p. 286.

Flowers without bracts. CHENOPODIACEÆ. p. 284.

8. — Seeds with albumen. Perianth colored. Embryo curved around the albumen. PHYTOLACCACEÆ. p. 284.

Seeds without albumen.

Perianth not tubular, imperfect, or spathe like.

PODOSTEMONACEÆ.

Perianth tubular.

Ovary two celled. AQUILARIACEÆ.

Ovary four celled. PENÆACEÆ.

9. — Carpels more than one, united into a solid pistil. **12**

Carpels single, or uncombined.

Perianth open, not tubular. **10**

Perianth tubular.

Anthers opening by recurved valves. *ATHEROSPERMACEÆ*.

Anthers opening lengthwise. *MYRISTICACEÆ*.

10. — Seeds with albumen. **11**

Seeds without albumen. Embryo straight.

Perianth two leaved. *CASUARINACEÆ*.

Perianth many parted. *CERATOPHYLLACEÆ*.

11. — Embryo curved around the albumen.

CHENOPODIACEÆ. p. 284.

Embryo straight. *MONIMIACEÆ*.

12. — Ovules numerous. Leaves pitcher like. *NEPENTHACEÆ*.

Ovules few.

Ovules ascending. *EMPETRACEÆ*.

Ovules suspended. *EUPHORBIACEÆ*. p. 293.

13. — Flowers imperfect, some staminate, some pistillate. **15**

Flowers perfect, having both stamens and pistils.

Carpels more than one, combined into a solid pistil. **14**

Carpel single.

Stipules single. *PETIVERIACEÆ*.

Stipules sheathing the stem. *POLYGONACEÆ*. p. 287.

14. — Leaves with round, transparent, solitary dots. *SAMYDACEÆ*.

Leaves without dots.

Perianth regular, in a double row. *CHAILLETIACEÆ*.

Perianth irregular, in a single row. *ULMACEÆ*. p. 296.†

15. — Carpels more than one, combined into a solid pistil. **16**

Carpel solitary.

Anther cells perpendicular to the filament. *STILAGINACEÆ*.

Anther cells parallel to the filament.

Sap watery. *URTICACEÆ*. p. 296.

Sap milky. *ARTOCARPACEÆ*.

16. — Flowers not in aments. *EUPHORBIACEÆ*. p. 293.

Flowers in aments.

Seeds without an aril. *BETULACEÆ*. p. 306.

Seeds with an aril.

Stamen one. Connective of the anther large. LACISTEMACEÆ.

Stamens two or more. Connective inconspicuous.

SCEPACÆÆ.

17. — Leaves with stipules. 19

Leaves without stipules.

Flowers imperfect, some staminate, some pistillate. **18**

Flowers perfect, having both stamens and pistils.

Ovary three to six celled, many seeded.

ARISTOLOCHIACEÆ. p. 282.

Ovary one celled.

Style one. SANTALACEÆ. p. 292.

Styles three or more. HOMALIACEÆ.

18. — Flowers not in aments. DATISCEACEÆ.

Flowers in aments.

Leaves alternate. MYRICACEÆ.

Leaves opposite.

Leaves simple. GARRYACEÆ. p. 167. †

Leaves compound. JUGLANDACEÆ. p. 300.

19. — Flowers imperfect, some staminate, some pistillate. 20

Flowers perfect, having both stamens and pistils.

Style one. ARISTOLOCHIACEÆ. p. 282.

Styles three or more. HOMALIACEÆ.

20. — Fruit in a cup. CORYLACEÆ. p. 302. †

Fruit naked.

Fruit simple. BEGONIACEÆ. p. 161.

Fruit consisting of many achenes partly immersed in a fleshy receptacle. ARTOCARPACEÆ.

II, b. GYMNOSPERMS.

Stem jointed. GNETACEÆ.

Stem not jointed.

Leaves pinnate. CYCADACEÆ. p. 309.

Leaves simple.

Seeds in cones. CONIFERÆ. p. 309.

Seeds solitary, in a berry like scale or cup.

TAXACEÆ. p. 310.

II, c. SPOROGENS or RHIZANTHS.

Ovules single. BALANOPHORACEÆ.

Ovules numerous.

Anthers opening by slits. CYTINACEÆ.

Anthers opening by pores. RAFFLESIIACEÆ.

Among Thalamifloral Exogens the following orders contain some species with a single perianth or none: Ranunculaceæ, Menispermaceæ, Papaveraceæ, Flacourtiaceæ, Caryophyllaceæ, Sterculiaceæ, Byttneriaceæ, Tiliaceæ, Malpighiaceæ, Geraniaceæ, Rutaceæ, Xanthoxylaceæ.

Among Calycifloral Exogens the following orders contain one or more species with a single perianth or none: Celastraceæ, Rhamnaceæ, Amyridaceæ, Leguminosæ, Rosaceæ, Lythraceæ, Combretaceæ, Myrtaceæ, Halorageæ, Cucurbitaceæ, Passifloraceæ, Portulacaceæ, Illicebraceæ, Tetragoniaceæ, Saxifragaceæ, Cunoniaceæ, Loranthaceæ.

Among Corollifloral Exogens the following orders contain some species with a single perianth or none: Oleaceæ, Primulaceæ.

Some consider Begoniaceæ, Chaillatiaceæ, Samydaceæ, and Homaliaceæ as thalamifloral or calycifloral.

III, a. ENDOGENS WITH NET VEINED LEAVES.

Perianth adhering to the ovary, ovary inferior.

DIOSCORACEÆ. p. 335.

Perianth free from the ovary.

Ovary three to five celled. 1

Ovary one celled.

Parts of flower in fours. Placentas at the base of the ovary.

ROXBURGHIIACEÆ.

Parts of flower in threes. PHILESIACEÆ. ✓

- 1.** — Flowers imperfect, some staminate, some pistillate. Perianth with six divisions, all petal-like. Leaves articulated with the stem. *SMILACEÆ*. p. 336.

Flowers perfect, having both stamens and pistils. Perianth with six or eight divisions, all green, or only three petaloid. Leaves not articulated. *TRILLIACEÆ*. p. 337.

III, b. AGLUMACEOUS ENDOGENS WITH PERIANTH ADHERENT TO OVARY.

Stamens attached to the pistil. **3**

Stamens separate from the pistil.

Veins of the leaves parallel with the midrib. **1**

Veins of the leaves running parallel from the midrib to the margin.

Stamens five or six, all perfect or bearing anthers.

MUSACEÆ. p. 329. †

Only one anther bearing stamen.

Anther one celled. Filament petal-like.

MARANTACEÆ. p. 328. †

Anther two celled. Filament not petaloid.

ZINGIBERACEÆ. p. 328.

Stamens more than six. Aquatic.

HYDROCHARIDACEÆ. p. 321.

- 1.** — Stamens six. **2**

Stamens three.

Anthers opening on the outer side. Embryo distinct, in a dense albumen. *IRIDACEÆ*. p. 332.

Anthers opening on the inner side. Embryo in a loose cellular nucleus. *BURMANNIACEÆ*.

- 2.** — Anthers turned outwards. *BURMANNIACEÆ*.

Anthers turned inwards.

Leaves folded partly together lengthwise. *HÆMODORACEÆ*.

Leaves flat, not folded.

Fruit one celled. *TACCACEÆ*.

Fruit three celled.

Outer perianth green. Albumen mealy. Leaves stiff, channeled, often scurfy. *BROMELIACEÆ*. p. 329.

Outer perianth colored. Albumen fleshy or hard.

III, c. ENDOGENS WITH FREE PERIANTH.

Outer perianth petal like. **2**

Outer perianth green, or sometimes glume-like.

Carpels combined into a solid pistil. **1**

Carpels more or less separate.

Placentas parietal, forming a net work on the inner surface of the ovary. Fruit many seeded. BUTOMACEÆ. p. 320.

Placentas in the axis, or at the base of the ovary.

Anthers opening on the outer side. Embryo straight, with a slit on the side, near the base. JUNCAGINEÆ.

Anthers opening on the inner side. Embryo curved like a horseshoe, with no slit. ALISMACEÆ. p. 319.

1. — Whorls of the perianth alike, usually dry and glume-like.

JUNCACEÆ. p. 349.

Whorls of the perianth visibly different.

Placentas in the axis. Anthers two celled.

COMMELYNACEÆ. p. 350. †

Placentas parietal. Anthers one celled. MAYACACEÆ.

2. — Carpels combined into a solid pistil. **3**

Carpels more or less separate.

Seed solitary. Flowers on a scaly spadix.

PALMÆ. p. 316. †

Seeds numerous. Flowers not on a spadix.

Anthers opening on the outer side. MELANTHACEÆ. p. 337.

Continuation of p. 22.

Leaves dry. Seeds with a beaked strophiole.

HYPOXIDACEÆ. p. 329. †

Leaves succulent. Seeds without a strophiole.

AMARYLLIDACEÆ. p. 329.

3. — Ovary one celled. Placentas parietal.

ORCHIDACEÆ. p. 323.

Ovary three celled. Placentas in the axis. APOSTASIACEÆ.

1. — Flowers imperfect, some staminate, some pistillate. Perianth with six divisions, all petal-like. Leaves articulated with the stem. SMILACEÆ. p. 336.

Flowers perfect, having both stamens and pistils. Perianth with six or eight divisions, all green, or only three petaloid. Leaves not articulated. TRILLIACEÆ. p. 337.

III, b. AGLUMACEOUS ENDOGENS WITH PERIANTH ADHERENT TO OVARY.

Stamens attached to the pistil. 3

Stamens separate from the pistil.

Veins of the leaves parallel with the midrib. 1

Veins of the leaves running parallel from the midrib to the margin.

Stamens five or six, all perfect or bearing anthers.

MUSACEÆ. p. 329. †

Only one anther bearing stamen.

Anther one celled. Filament petal-like.

MARANTACEÆ. p. 328. †

Anther two celled. Filament not petaloid.

ZINGIBERACEÆ. p. 328.

Stamens more than six. Aquatic.

HYDROCHARIDACEÆ. p. 321.

1. — Stamens six. 2

Stamens three.

Anthers opening on the outer side. Embryo distinct, in a dense albumen. IRIDACEÆ. p. 332.

Anthers opening on the inner side. —————

III, c. ENDOGENS WITH FREE PERIANTH.

Outer perianth petal like. **2**

Outer perianth green, or sometimes glume-like.

Carpels combined into a solid pistil. **1**

Carpels more or less separate.

Placentas parietal, forming a net work on the inner surface of the ovary. Fruit many seeded. BUTOMACEÆ. p. 320.

Placentas in the axis, or at the base of the ovary.

Anthers opening on the outer side. Embryo straight, with a slit on the side, near the base. JUNCAGINEÆ.

Anthers opening on the inner side. Embryo curved like a horseshoe, with no slit. ALISMACEÆ. p. 319.

1.—Whorls of the perianth alike, usually dry and glume-like.

JUNCACEÆ. p. 349.

Whorls of the perianth visibly different.

Placentas in the axis. Anthers two celled.

COMMELYNACEÆ. p. 350. †

Placentas parietal. Anthers one celled. MAYACACEÆ.

2.—Carpels combined into a solid pistil. **3**

Carpels more or less separate.

Seed solitary. Flowers on a scaly spadix.

PALMÆ. p. 316. †

Seeds numerous. Flowers not on a spadix.

Anthers opening on the outer side. MELANTHACEÆ. p. 337.

Anthers opening on the inner side.

Perianth of six parts. BUTOMACEÆ. p. 320.

Perianth of two parts. PHILYDRACEÆ.

3.—Anthers opening on the outer side. Outer perianth glume-like. XYRIDACEÆ. p. 351.

Anthers opening on the inner side.

Flowers more or less irregular. Perianth rolling inwards after expansion. AQUATIC. PONTEDERIACEÆ. p. 322.

Flowers regular. Perianth not rolling inwards.

Inner perianth minute, of a single lobe, or urn shaped, or five toothed. GILLIESIACEÆ.

Inner and outer perianth alike. LILIACEÆ. p. 337.

III, d. APETALOUS ENDOGENS.

Flowers not on a spadix. 1

Flowers on a spadix.

Flowers perfect, having both stamens and pistils.

ORONTIACEÆ.

Flowers imperfect, some staminate, some pistillate.

Embryo without a cleft on the side. Fruit one seeded fibrous nuts, or many celled berries. PANDANACEÆ.

Embryo with a cleft at one side in which the plumule lies.

Fruit juicy, filaments very short. Perianth none.

ARACEÆ. p. 317.

Fruit dry. Filaments long with wedge shaped anthers. Perianth consisting of scales or hairs. TYPHACEÆ. p. 318.

1. — Ovules erect. 3

Ovules suspended.

Carpels several. 2

Carpel single.

Anthers one celled. RESTIACEÆ.

Anthers two celled. NAIADACEÆ. p. 316.

2. — Carpels combined into a solid pistil. RESTIACEÆ.

Carpels separate.

Anthers one celled. DESVAUXIACEÆ.

Anthers two celled.

Ovary surrounded by a membranous tube.

ERIOCAULONACEÆ. p. 352.

Ovary without a surrounding tube. NAIADACEÆ. p. 316.

Embryo consisting of a cellular nucleus, with no distinction of parts. TRI^uARIDACEÆ.

Embryo with radicle and plumule conspicuous.

Flowers naked or furnished with scales. Seeds without a thickened covering. Foramen not hardened.

NAIADACEÆ. p. 316.

Flowers contained in a spathe. Seeds with a thick ribbed covering. Foramen hardened. PISTIACEÆ. p. 316. †

III, e. GLUMACEOUS ENDOGENS.

Stem hollow. Leaf sheath split. Embryo outside the albumen at its base. GRAMINEÆ. p. 353.

Stem solid. Leaf sheath not split. Embryo within the base of the albumen. CYPERACEÆ. p. 352.

IV, a. ACROGENS.

Stem and leaves not distinct. 2

Stem and leaves distinct.

Spores without elaters. 1

Spores provided with elaters.

Sporangia opening by four valves. JUNGERMANNIACEÆ.

Sporangia opening by a fissure lengthwise, collected in cone like heads at the summit of the stem.

EQUISETACEÆ. p. 359.

1. — Sporangia inclosed in two or four valved sporocarps which are situated at the base of the leaves or leaf stalks.

MARSILEACEÆ.

Sporangia not inclosed in sporocarps.

Sporangia in the back or margin of the frond.

FILICES. p. 360.

Sporangia distinct from the leaves.

Sporangia sessile in the axil of leaves.

LYCOPODIACEÆ. p. 372.

Sporangia borne on stalks. MUSCI.

2. — Spores with elaters. MARCHANTIACEÆ.

Spores without elaters. RICCIACEÆ.

IV, b. THALLOGENS.

Plants with a mycelium. Growing in the shade. Never green. FUNGI.

Plants without a mycelium.

Growing in dry places, in the light. LICHENES.

Aquatic.

Germinating bodies in spiral, nut like cases. CHARACEÆ.

Germinating bodies in cells not spiral. ALGÆ.





